

Abstract Submitted  
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**Active Control of Jet Noise Using High Resolution TRPIV Part 2: Velocity-Pressure-Acoustic Correlations** KERWIN LOW, Syracuse University, STANISLAV KOSTKA, Spectral Energies, LLC, ZACHARY BERGER, Syracuse University, MATTHEW BERRY, Syracuse University, SIVARAM GOGI-NENI, Spectral Energies, LLC, MARK GLAUSER, Syracuse University — We investigate the pressure, velocity and acoustic field of a transonic jet. Test conditions comprise a 2 inch nozzle, analyzing two flow speeds, Mach 0.6 and 0.85, with open loop control explored for the Mach 0.6 case. We make simultaneous measurements of the near-field pressure and far-field acoustics at 40 kHz, alongside 10 kHz time resolved PIV measurements in the r-z plane. Cross correlations are performed exploring how both the near-field Fourier filtered pressure and low dimensional POD modes relate to the far-field acoustics. Of interest are those signatures which exhibit the strongest correlation with far-field, and subsequently how these structures can be controlled. The goal is to investigate how flow-induced perturbations, via synthetic jet actuators, of the developing shear layer might bring insight into how one may alter the flow such that the far-field acoustic signature is mitigated. The TR-PIV measurements will prove to be a powerful tool in being able to track the propagation of physical structures for both the controlled and uncontrolled jet.

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